WHAT IS CLAIMED IS:

1. An optical fiber coating method comprising the steps of:

applying a first coating resin to the outer periphery of an optical fiber by injecting a first coating resin into a clearance between a first die hole and said optical fiber, while inserting said optical fiber through said first die hole provided in a first coating die and having an inside diameter greater than an outside diameter of said optical fiber; and

applying a second coating resin onto said first coating resin by injecting a second coating resin into a clearance between a second die hole and the surface of said first coating resin applied to said optical fiber, while inserting said optical fiber through said second die hole provided in said second coating die and having an inside diameter greater than that of said first die hole,

wherein a disk-shaped upper end face of said second coating die and a basically disk-shaped lower end face of said first coating die having a protrusion formed around said first die hole and projecting in the passing direction of said optical fiber are opposed to each other so as to arrange said first and second die holes concentrically, and said second coating resin is injected into said second die hole by way of a gap formed between the lower end face of said first coating die and the upper end face of said second

coating die, so as to reduce an annular lower-pressure region formed around said optical fiber in a flow of said second coating resin within said gap.

2. An optical fiber coating method according to claim 1, wherein said first and second coating dies concentrically fit the cylindrical inner peripheral face of a positioning member, each of said first and second coating dies and the inner peripheral face of said positioning member being constituted by a material having a Young's modulus of 5×10^4 kg/mm^2 or greater and a coefficient of thermal expansion of 6×10^{-6}/°C or lower.

Sub A1

3. An optical fiber coating apparatus for applying first and second coating resins as a laminate to the outer periphery of an optical fiber, said apparatus comprising:

a first coating die having a first die hole through which said optical fiber is inserted and a basically disk-shaped lower end face with a protrusion projecting in the passing direction of said optical fiber and formed around said first die hole, said first die hole and the outer periphery of said optical fiber therein forming a space therebetween into which said first coating resin is injected; and

a second coating die having a second die hole which is concentric with said first die hole and through which said optical fiber passed through said first die hole is inserted and an upper end face comprising a circular plate

Sub A1

opposing the lower end face of said first coating die so as to form a gap through which said second coating resin is injected into a space formed between said second die hole and the outer periphery of said optical fiber therein;

said protrusion being formed so as to reduce an annular lower-pressure region formed around said optical fiber in a flow of said second coating resin within said gap.

Sub C1

4. An optical fiber coating apparatus according to claim 3, wherein said protrusion is shaped like a circular truncated cone.

Sub A2

5. An optical fiber coating apparatus according to claim 4, wherein said apparatus satisfies:

$$0.05G < H < 0.5G$$

$$(D_2 - D_1)/2 < W < G$$

$$0.01\,mm \le L < W$$

where H is the height of the circular truncated cone of said protrusion, W is the distance between the outer periphery of the bottom portion of said circular truncated cone and the inner peripheral face of said first die hole, L is the distance between the outer periphery of the head portion of said circular truncated cone and the inner peripheral face of said first die hole, D_1 is the inner peripheral face diameter of said first die hole on the outlet side of said optical fiber, D_2 is the inner peripheral face diameter of said second die hole on the inlet side of said optical fiber, and G is the distance of the gap between said first and second

Sub A2

coating dies.

Sub B3

6. An optical fiber coating apparatus according to claim 3, further comprising a positioning member having a cylindrical inner peripheral face adapted to fit the respective outer peripheral faces of said first and second coating dies,

each of said first and second coating dies and the inner peripheral face of said positioning member being constituted by a material having a Young's modulus of 5×10^4 kg/mm^2 or greater and a coefficient of thermal expansion of 6×10^{-6}/°C or lower.

Sub C1

7. An optical fiber coating apparatus according to claim 6, wherein said positioning member is constituted by an inner periphery member made of cemented carbide forming said inner peripheral face and an outer periphery member made of alloy tool steel having a lower Young's modulus and a higher coefficient of thermal expansion than said inner periphery member which are fastened and secured together by interference fitting.

8. An optical fiber coating apparatus according to claim 6, wherein a bottom face of said first or second die has a tap used for attachment/detachment with respect to said positioning member.

9. An optical fiber coating apparatus according to claim 6, further comprising a nipple made of a material having a Young's modulus, a coefficient of thermal expansion,

Sub C1

and a hardness which are substantially identical to those of the inner peripheral face of said positioning member, said nipple being adapted to fit the inner peripheral face of said positioning member such that a nipple hole for guiding the inserted optical fiber to said first die hole is arranged concentric with said first die hole.

Add A3

add B5